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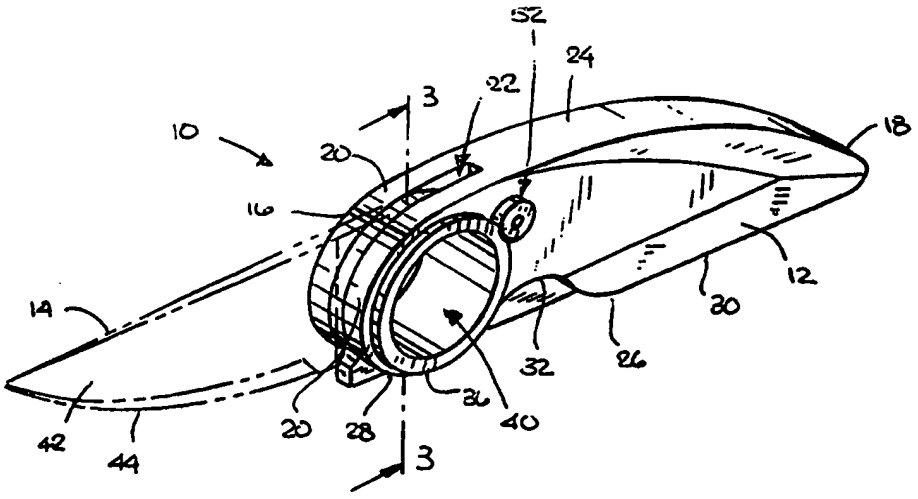


(57) Abstract

A folding knife (10) includes a handle (12) and a blade (14) pivotally coupled to the handle (12). The handle (12) has first and second ends (16, 18) and a pair of side walls (20) extending between the two ends (16, 18). The handle (12) also includes a longitudinal slot (22) disposed between the pair of side walls (20) for housing the blade (14). The blade (14) is pivotally coupled to the first end (16) of the handle (12) and is rotatable between a folded position, in which the blade (14) is situated in the longitudinal slot (22), and an extended position. Formed in a shank portion (46) of the blade (14) is an opening (48) for receiving a user's finger and improving the user's control of the knife (10) during a cutting operation.

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# FOLDING KNIFE

## FIELD OF THE INVENTION

This invention relates to a pocket tool having an implement, such as a knife or saw. More particularly, the present invention relates to a foldable knife having a finger opening for providing a user with better control of the knife during a cutting operation.

## BACKGROUND OF THE INVENTION

Pocket tools, such as foldable knives and saws are well known in the art. Typically, these tools include a housing, which also serves as a handle, and a knife or saw blade coupled thereto. The blade, which is movable between a stored position and an extended position, is pivotally coupled to the housing at an end thereof. When not in use, the blade may be compactly stored in the housing. When the blade is in the extended position, the tool may be used to perform a cutting operation.

One disadvantage to currently available pocket tools is that they are often difficult to handle. In attempts to minimize the size and weight of these pocket tools, the dimensions of the handles are also reduced, making it more difficult for users with larger hands to grasp. If a user is unable to obtain a firm grasp on the handle of the pocket tool, the user will have less control over a cutting operation and may damage a workpiece. In light of the foregoing, there is a need for a pocket tool that provides a user with better control of the pocket tool during operation.

## SUMMARY OF THE PRESENT INVENTION

In accordance with one aspect of the present invention, a folding knife includes a handle and a blade coupled to the handle. The handle includes first and second ends and a pair of side walls extending therebetween. The handle also includes a longitudinal slot, which is disposed between the pair of side walls. The blade is pivotally coupled to the first end of the handle. The blade, which includes a cutting edge and a shank portion, rotates between a folded position, in which the blade is housed in the longitudinal slot of the handle, and an extended position. An opening is formed in the shank portion of the blade. The opening is adapted to receive a user's finger and to improve the user's control of the knife during a cutting operation.

In accordance with another aspect of the invention, a folding knife includes a handle, a blade and a locking mechanism. The handle includes first and second ends and a pair of side walls extending therebetween. The handle has a longitudinal slot disposed between the side walls. In addition, the handle has an opening formed in the pair of side walls proximate the first end. The blade, which includes a cutting edge and a shank portion, is pivotally coupled to the handle at the first end. The blade is rotatable between a folded position, in which the blade is housed in the longitudinal slot of the handle, and an extended position. The shank portion of the blade has an opening formed therein, which coincides with the opening in the side walls of the handle. The openings are adapted to receive a user's finger and to improve the user's control of the knife during a cutting operation. The locking mechanism, which is coupled to the handle, engages the blade to secure the blade in either the folded or extended position.

In accordance with still another aspect of the invention, an improved folding knife is provided. The knife includes a handle and a blade pivotally coupled thereto. The blade includes a cutting edge and a shank portion. The improvement includes at least one opening formed in the shank portion of the blade. The at least one opening is adapted to receive a user's finger and to improve the user's control over the knife during a cutting operation.

Other principal features and advantages of the invention will become apparent to those skilled in the art upon review of the following drawings, the detailed description and the appended claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the following detailed description, taken in conjunction with the accompanying drawings, wherein like reference numerals denote like elements, in which:

FIGURE 1 is a front, perspective view of a folding knife according to the present invention, having a pivotally coupled blade shown in a folded position (in solid lines) and an extended position (in phantom lines);

FIGURE 2 is an exploded, perspective view of the folding knife of FIG. 1 with the blade shown in the extended position; and

FIGURE 3 is a cross-sectional view taken generally along the line 3-3 of FIG. 1.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring generally to FIGS. 1 and 2, an exemplary pocket tool, such as a folding knife 10, in accordance with the present invention is provided. The folding knife 10 includes a housing or handle 12 and a blade 14 for cutting a workpiece (not shown). While the blade 14 is presently shown as a knife blade, it may also be a saw blade. The blade 14 is pivotally coupled to the handle 12 and may be stored within the handle 12 when not in use.

The handle 12 includes a first end 16 and a second end 18. The handle 12 also includes a pair of side walls 20, which extend between the first and second ends 16 and 18. The handle 12 is preferably made of a durable plastic material and may be injection molded or otherwise formed. Disposed between the side walls 20 of the handle 12 is a longitudinal slot 22. The longitudinal slot 22 receives the blade 14, when the blade 14 is in a stored position, as shown in solid lines in FIG. 1.

The handle 12 has a top edge 24 and a bottom edge 26, both of which extend from the first end 16 to the second end 18. In the preferred embodiment, the top edge 24 is arcuate in configuration and tapers toward the second end 18 where it converges with the bottom edge 26. The bottom edge 26 has a curved portion 28 adjacent the first end 16 and a generally straight portion 30 proximate the second end 18. The curved portion 28 of the bottom edge 26 includes a recess 32. The recess 32 provides access to the blade 12 when it is in the stored position. In addition, when the blade 14 is in an extended position, as shown in phantom lines in FIG. 1, the recess 32 provides an ergonomic support against which a user's finger may rest while gripping the knife 10.

As shown in FIG. 2, the side walls 20 of the handle 12 have an opening 34 formed therein for receiving a bearing member 36 The bearing member 36 is mounted to the handle 12 and secured in place by a retaining ring 38. In the preferred embodiment of the invention, the bearing member 36 is shaped like a spool with an opening 40 formed along the longitudinal axis of the bearing member 36. The opening 34 in the side walls 20 and the opening 40 in the bearing member 36 are concentric and are sufficiently large to receive a user's index finger (not shown), thereby enabling the user to firmly grasp and manage the folding knife 10 during a cutting operation.

The blade 14 is pivotally coupled to the first end 16 of the handle 12 and rotates about the bearing member 36. The blade 14 is preferably made of a durable, corrosion-resistant material, such as stainless steel, and may be formed by casting or other manufacturing methods. The blade 14 includes a working portion 42 having a cutting edge 44 and a shank portion 46. The shank portion 46 of the blade 14 also has an opening 48 formed therein, through which the bearing member 36 extends. In the preferred embodiment of the invention, the opening 34 in the side walls 20 of the handle 12 coincides with the opening 48 in the shank portion 44 of the blade 14, and both openings 34 and 48 are concentric with the opening 40 in the bearing member 36 (FIG. 3). Thus, the blade 14 pivots about an axis 50 that extends through the center of the openings 34, 40 and 48. The folding knife 10 may further include a belt clip 66, mounted to the handle 12 about the bearing member 36, for coupling the knife 10 to a belt (not shown).

The folding knife 10 further includes a locking mechanism 52 (see FIG. 1), which is mounted to the handle 12. The locking mechanism 52 engages notches 54 (FIG. 2) formed in the shank portion 46 of the blade 14 to secure the blade 14 in either the folded or extended position. As shown in FIG. 2, the notches 54 are located along an edge of the shank portion 46 and are diametrically spaced about the opening 48.

The locking mechanism 52, whose components are best illustrated in FIG. 2, includes a lock pin 56 having a shaft 58 and an enlarged head 60 at one end of the shaft 58. A spring 62 and a dowel 64 are mounted on the shaft 58. The dowel 64, which is located at the end of the shaft 58 opposite the enlarged head 60, is biased by the spring 62 into engagement with the notches 54 of the shank portion 46 of the blade 14. To release the blade 14 from a locked position, the user would depress the enlarged head 60 of the lock pin 56, thereby disengaging the dowel 64 from the respective notch 54 and enabling the user to rotate the blade 14 with respect to the handle 12.

Thus, the folding knife 10 operates as follows. When not in use, the blade 14 is housed in the longitudinal slot 22 of the handle 12, with the locking mechanism 52 maintaining the blade 14 in the stored position. To extend the blade 14, the lock pin 56 is depressed, disengaging the dowel 64 from the notch 54. The user may then extend the blade 14 by grasping the portion of the blade 14 exposed by the recess 32 and rotating the blade 14 with respect to the handle 14. When the blade 14 is fully extended, the locking mechanism automatically engages the blade 14, as the spring 62 urges the dowel 64 into the notch 54. The blade 14 is thereby locked in the extended position. During a cutting operation, the user would grip the handle 14 with the index finger extending through the opening 40 of the bearing member 36 and the middle finger resting against the recess 32. The configuration of the folding knife 10 is such that it enables the user to maintain better control of the knife by providing a stable and secure handle 14. The blade 14 may be stored by depressing the locking mechanism 52 and rotating the blade 14 back into the longitudinal slot 22 of the handle 12.

It will be understood that the foregoing description is of the preferred embodiments of this invention and that the invention is not limited to the specific

forms shown or described. For example, while the preferred embodiment of the invention discloses a folding knife in which the blade pivots about the opening for the user's finger, the blade need not pivot about the finger opening. In addition, a finger opening may be provided in only one of the blade or the handle. Additional openings may also be provided to accommodate two or more fingers. Moreover, it is foreseeable that other locking mechanisms may be used in conjunction with the knife to secure the blade in either the stored or extended position. These and other modifications may be made in the design and arrangement of the elements without departing from the scope of the invention as expressed in the appended claims.

CLAIMS

What is claimed is:

1. A folding knife comprising:

a handle including first and second ends and a pair of side walls extending therebetween, the handle having a longitudinal slot disposed between the pair of side walls; and

a blade pivotally coupled to the handle at the first end and rotatable between a folded position, in which the blade is housed in the longitudinal slot, and an extended position, the blade having a cutting edge and a shank portion, the shank portion of the blade having an opening formed therein for receiving a user's finger and improving the user's control of the knife during a cutting operation.

2. The folding knife of claim 1, wherein the handle includes an opening formed in the pair of side walls proximate the first end, the opening being coincident with the opening in the blade when the blade is in the extended position.

3. The folding knife of claim 2, wherein the blade pivots about an axis extending through the center of the openings.

4. The folding knife of claim 1, wherein the handle further includes a locking mechanism for securing the blade in either the folded or extended position.

5. The folding knife of claim 4, wherein the shank portion of the blade has at least one notch formed in an edge thereof, the locking mechanism engaging the at least one notch when the blade is in either the folded or extended position.

6. The folding knife of claim 5, wherein the locking mechanism includes a pin and a spring, the spring biasing the pin into engagement with the at least one notch.

7. The folding knife of claim 6, wherein the spring is a compression spring, and wherein the pin includes a shaft having an enlarged head at a first end and a dowel at a second end, the spring being disposed on the shaft between the enlarged head and the dowel, the dowel being movable into and out of engagement with the at least one notch of the blade.

8. The folding knife of claim 5, wherein the blade includes two notches disposed diametrically about the opening of the blade.

9. The folding knife of claim 1, wherein the pair of side walls includes a recess for supporting a finger during the cutting operation, the recess being located along a bottom edge thereof.

10. A folding knife comprising:

a handle including first and second ends and a pair of side walls extending therebetween, the handle having a longitudinal slot disposed between the pair of side walls and an opening formed in the pair of side walls proximate the first end;

a blade pivotally coupled to the handle at the first end and rotatable between a folded position, in which the blade is housed in the longitudinal slot of the handle, and an extended position, the blade having a cutting edge and a shank portion, the shank portion having an opening formed therein and coinciding with the opening of the handle, the openings for receiving a user's finger and improving the user's control of the knife during a cutting operation; and

a locking mechanism for securing the blade in either the folded or extended position, the locking mechanism being coupled to the handle and engaging the blade.

11. The folding knife of claim 10, wherein the blade pivots about an axis extending through the center of the openings.

12. The folding knife of claim 10, wherein the shank portion of the blade has at least one notch formed in an edge thereof, the locking mechanism engaging the at least one notch to secure the blade in either the folded or extended position.

13. The folding knife of claim 12, wherein the locking mechanism includes a pin and a spring, the spring biasing the pin into engagement with the at least one notch.

14. The folding knife of claim 13, wherein the spring is a compression spring, and wherein the pin includes a shaft having an enlarged head at a first end and a dowel at a second end, the spring being disposed on the shaft between the enlarged head and the dowel, the dowel being movable into and out of engagement with the at least one notch of the blade.

15. The folding knife of claim 10, wherein the pair of side walls includes a recess for supporting a finger during the cutting operation, the recess being located along a bottom edge thereof.

16. An improved folding knife having a handle and a blade pivotally coupled to the handle, the blade including a cutting edge and a shank portion, the improvement comprising at least one opening formed in the shank portion of the blade, the at least one opening for receiving a user's finger and improving the user's control of the knife during a cutting operation.

17. The folding knife of claim 17, wherein the handle includes a pair of side walls, the at least one opening of the blade coinciding with at least one opening formed in the pair of side walls, the blade being rotatable about an axis extending through the center of the openings.

18. The folding knife of claim 17, wherein the pair of side walls includes a recess for supporting a finger during the cutting operation, the recess being located along a bottom edge thereof.

FIG. 1

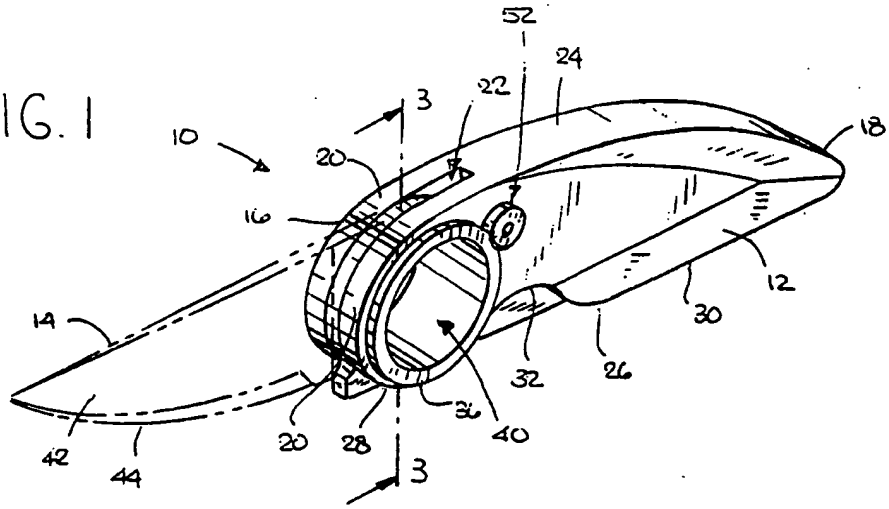
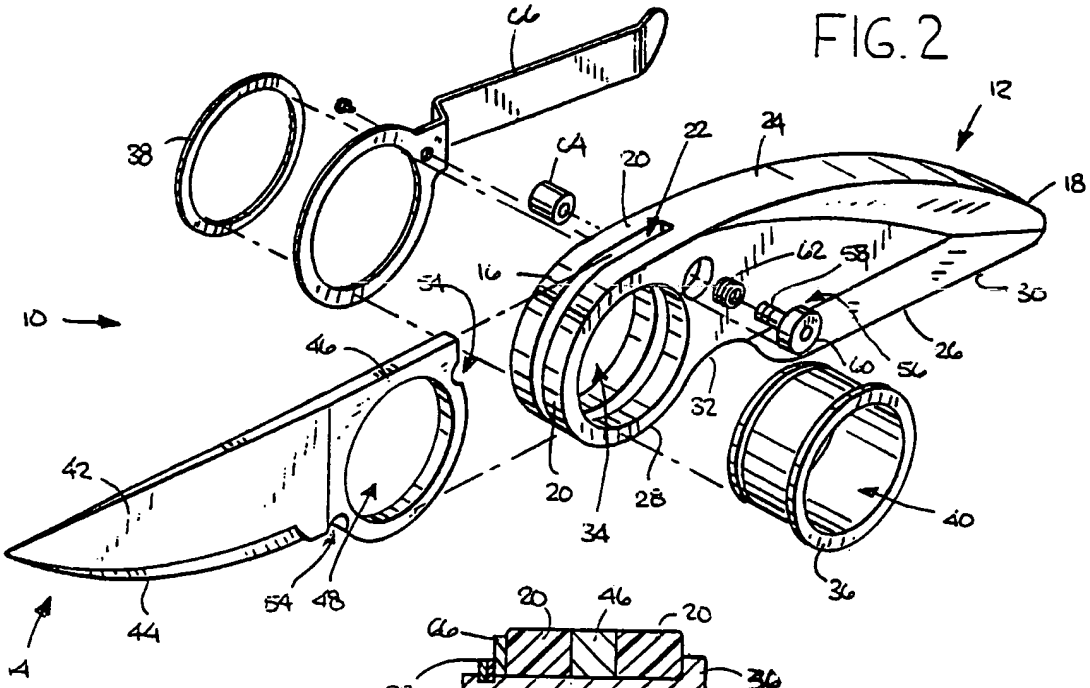



FIG. 2



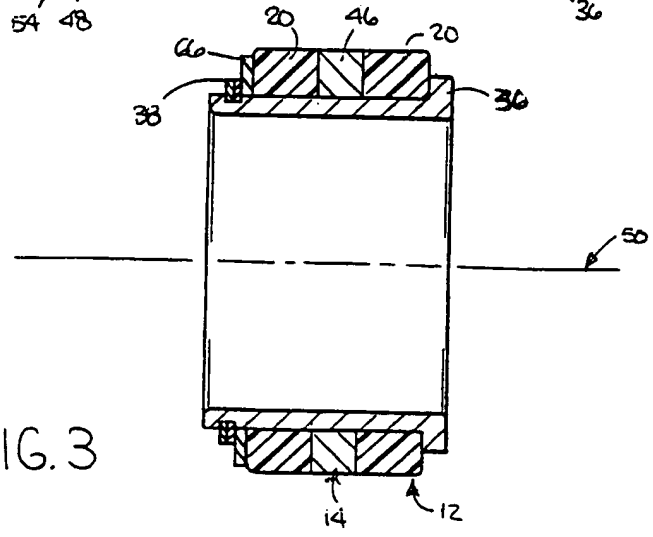




FIG. 3

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/09545

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(6) :B26B 1/02
US CL :30/155,161,340

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 30/151,155,161,298,340

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

none

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

none

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | US 2,824,368 A (BASSETT) 25 February 1958, see Figs.1-3. | 1-4,9-11 and 15-18 |
| Y | US 4,087,911 A (SCHROCK ET AL.) 09 May 1978, see Figs.8-9, Abstract and lines 44-50 of column 1. | 1-4,9-11 and 15-18 |
| A | US 5,093,995 A (JAN) 10 March 1992, see the entire document. | 7 and 14 |
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☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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